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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,867	06/14/2005	Bernhard Hiller	407-376	4283

7590 02/12/2007  
Mark P Stone  
25 Third Street  
4th Floor  
Stamford, CT 06905

EXAMINER
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KHUU, HIEN DIEU THI

ART UNIT	PAPER NUMBER
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2863

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/12/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/538,867

Applicant(s)

HILLER, BERNHARD

Examiner

Cindy D. Khuu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4-27,29-32 and 34-55 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-27,29,32 and 46-55 is/are allowed.
- 6) ☒ Claim(s) 1,4-6,9,21 and 35 is/are rejected.
- 7) ☒ Claim(s) 7,8,10-20,22,30,31,34 and 36-45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/15/06</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4-6, 9, 21 and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Herzer (US 2005/0052179).

With respect to claim 1, Herzer discloses a method for measuring the position of an object (Fig. 9), the steps of said method comprising: calculating a first digital position signal ( $D_A$ ) which represents a position measured by a position sensor (200) from an input sine signal ( $U_{sin}$ ) and an input cosine signal ( $U_{cos}$ ) produced by the position sensor (200) (Fig. 9); digitally filtering (330; Paragraph 62, lines 1-5) said first position signal ( $D_A$ ) for forming a second digital position signal ( $D_C$ ) having a resolution which is higher than that of said first digital position signal (Paragraph 63, lines 1-10); and producing an output sine signal ( $SinOut$ ) and an output cosine signal ( $CosOut$ ) as a function of the second digital position signal (Paragraph 65), the input signals ( $U_{sin}$ ,  $U_{cos}$ ) having signal periods which are multiples of the signal periods of the output signals ( $SinOut$ ,  $CosOut$ ) (Paragraph 57, lines 3-4) respectively, such that the frequency of the output signals ( $SinOut$ ,  $CosOut$ ) is increased relative to the frequency of the input signals ( $U_{sin}$ ,  $U_{cos}$ ) (Fig. 9; smaller signal periods, higher frequency), respectively.

With respect to claim 4, Herzer further discloses the step of filtering the position signal through a low pass filter (Paragraph 62, lines 1-2).

With respect to claim 5, Herzer further discloses the step of filtering the position signal by forming a sliding mean value (Paragraph 63).

With respect to claim 6, Herzer further discloses the step of filtering out of the position signal errors which are typical of the signal transmitter (high-frequency noise; Paragraph 60, line 13).

With respect to claim 9, Herzer further discloses the step of error-correcting (filtering) the input sine signal and the input cosine signal before calculating the position signal (310; Fig. 9; Paragraph 60, lines 7-13).

With respect to claim 21, Herzer further discloses the step of producing the input signals from a position or angle measurement system (Figs. 2-3).

With respect to claim 35, Herzer further discloses a method for measuring the position of an object (Fig. 9), the steps of said method comprising: calculating a digital position signal ( $D_A$ ) which represents a position measured by a position sensor (200) from an input sine signal ( $U_{sin}$ ) and an input cosine signal ( $U_{cos}$ ) produced by the position sensor (200) (Fig. 9); producing an output sine signal and an output cosine signal as a function of the digital position signal ( $D_A$ ) (Fig. 9; 320, A/D), the signal periods of the input signals ( $U_{sin}$ ,  $U_{cos}$ ) being multiples of the signal periods of the output signals ( $SinOut$ ,  $CosOut$ ) (Paragraph 57, lines 3-4), respectively; and error-correcting (filtering) the input signal and the input cosine signal before calculating the position signal (310; Fig. 9; Paragraph 60, lines 7-13).

#### ***Allowable Subject Matter***

Claims 23-27, 29, 32, 49-51, 46-48 and 52-55 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

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The primary reason for the allowance of claim 23 is the inclusion of the limitation "a digital filter arranged between the calculation unit and a register wherein the position signal has a resolution of  $i$  bits upstream of the digital filter, and has a resolution of  $k$  bits downstream from the digital filter, where  $k > i$ ". The prior art of record, taken alone or in combination, fails to disclose or render obvious.

The primary reason for the allowance of claim 46 is the inclusion of the limitation "matching the quadrant position of a reference signal relative to the input signals to the output signals". The prior art of record, taken alone or in combination, fails to disclose or render obvious.

The primary reason for the allowance of claim 52 is the inclusion of the limitation "a signal conditioning unit arranged before the calculation unit, said signal conditioning unit adapted to calculate and correct discrepancies from the nominal states of the input sine signal and the input cosine signal". The prior art of record, taken alone or in combination, fails to disclose or render obvious.

Claims 24-27, 29, 32, 49-51, 47-48 and 53-55 are allowed due to their dependency on claims 23, 46 and 52.

Claims 7-8, 10-20, 22, 30-31, 34 and 36-45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record, taken alone or in combination, fails to disclose or render obvious, which makes the following claims allowable over the prior art:

With respect to claim 7, the step of filtering errors out of the position signal includes the step of using stored error curves which are dependent on the signal transmitter.

With respect to claim 8, the step of calculating the position signal from the arctan essentially of the quotient from the input sine signal and the input cosine signal.

With respect to claims 10 and 36, the step of compensating for different amplitudes of the input sine signal and of the input cosine signal in the step of error-correcting.

With respect to claims 11 and 37, the step of regulating out discrepancies between the offset in the input sine signal and/or the input cosine signal and a nominal offset during the step of error-correcting.

With respect to claims 12 and 38, the step of correcting the phase errors in the input sine signal and/or the input cosine signal during the step of error-correcting.

With respect to claims 13 and 39, the step of calculating the correction values which are used to correct the errors in the input sine signal and/or in the input cosine signal from the input sine signal and/or from the input cosine signal themselves or itself.

With respect to claims 14 and 40, the step of producing the position signal in the form of an essentially periodically varying, digital numerical value from k bits, from which a word element is read from m successive bits.

With respect to claim 17, the step of increasing the frequency of the input signals by an integer factor.

With respect to claims 18 and 43, the step of increasing the frequency of the input signals by the factor  $2^{k-km}$  in the output signals.

With respect to claims 19 and 44, the step of reading the output signals as a function of the position signal from at least one output table containing digitized values ( $*(0), \dots, *(2^m-1)$ ) of a sine function.

With respect to claims 22 and 45, the step of matching the quadrant position of a reference signal relative to the input signals to the output signals.

With respect to claim 34, the step of compensating for the time delay that occurs as a result of the digital filtering of the position signal.

With respect to claim 41, the step of using the m word for addressing at least one output table for producing the output signals.

With respect to claim 42, the step of shifting the position of the m word within the k word by means of a read unit, for changing the frequency of the output signals.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Response to Arguments***

Applicant's amendments combined with arguments filed 11/15/06 have been fully considered and are persuasive. Therefore, all rejections and objections are withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Herzer (US 2005/0052179). See rejections above.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed,

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and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Fax/Telephone Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cindy D. Khuu whose telephone number is (571) 272-8585. The examiner can normally be reached on M-F, 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

2/5/07 CML



MICHAEL NGHIEM  
PRIMARY EXAMINER